



## DEFENSE LOGISTICS AGENCY

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IN REPLY  
REFER

DSCC-VAI (Mr. Ron Gary/(614) 692-0568)

1 March 2004

### MEMORANDUM FOR MILITARY/INDUSTRY DISTRIBUTION

SUBJECT: Initial Draft of MIL-DTL-39030E; Dummy Loads, Electrical, Coaxial and Stripline, General Specification For; Project Number 5985-1289-000.

The initial draft for this subject document will be available for viewing and downloading from the DSCC-VAI Web site within the next 5 working days:

<http://www.dsccl.dla.mil/Programs/MilSpec/initialdrafts.asp>

Changes to this document include reference updates and reformatting, however, the entire specification is offered for comment.

Concurrence or comments are required at this Center within 45 days from the date of this letter. Late comments will be held for the next coordination of this document. Comments from Military Departments must be identified as either "Essential" or "Suggested". Essential comments must be justified with supporting data. Military review activities should forward comments to their custodians, as applicable, in sufficient time to allow for consolidation of the Department reply.

Please forward your comments or concurrence electronically to the point of contact listed below. This can be in the form of a return e-mail, with or without attached text files. If an electronic response is not possible, we will accept comments via letter, facsimilie, or phone call. Any further coordination concerning this document will be circulated only to firms and organizations that furnish comments or reply that they have an interest.

The point of contact for this document is Mr. Ron Gary. The preferred method of contact is via e-mail: [Estel.Gary@dla.mil](mailto:Estel.Gary@dla.mil). Mr. Gary can also be reached at 614-692-0568/DSN 850-0568, or by facsimilie 614-692-6940.

Sincerely,  
/signed/

RICHARD L. TAYLOR  
Chief,  
Interconnection Devices Team

MIL-DTL-39030E  
**NOT DATED**  
SUPERSEDING  
MIL-DTL-39030D  
28 June 2000

## DETAIL SPECIFICATION

### DUMMY LOADS, ELECTRICAL, COAXIAL AND STRIPLINE, GENERAL SPECIFICATION FOR

This specification is approved for use by all Departments  
and Agencies of the Department of Defense.

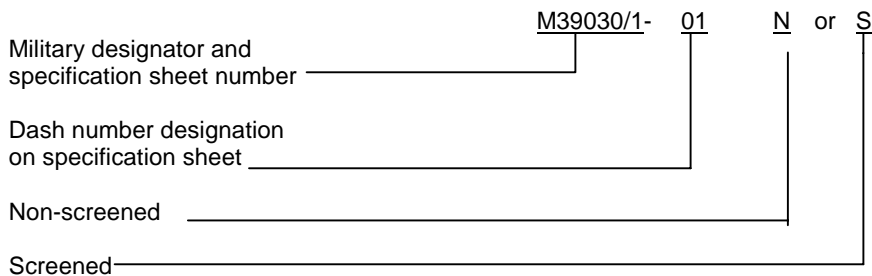
#### 1. SCOPE

1.1 Scope. This specification covers the qualification and general requirements for coaxial and stripline electrical dummy loads (see 6.1).

1.2 Classification. Dummy loads are of the following types.

Type	RF connector interface series	Connection specification
I	SMA	MIL-STD-348
II	SMC	MIL-STD-348
III	BNC	MIL-STD-348
IV	TNC	MIL-STD-348
V	N	MIL-STD-348
VI	C	MIL-STD-348
VII	SC	MIL-STD-348
VIII	HN	MIL-STD-348
IX	LC	MIL-STD-348
X	LT	MIL-STD-348
XI	7/8 inch	MIL-F-24044
XII	1-5/8 inch	MIL-F-24044
XIII	3-1/8 inch	MIL-F-24044
XIV	Stripline	---

1.2.1 Part or Identifying Number (PIN). The military PIN is to consist of the letter "M" followed by the basic number of the specification sheet, assigned dash number (see 3.1) and the letter N or S where N indicates a non-screened production item and S indicates a screened production item:



Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Columbus, ATTN: VAI, P. O. Box 3990, Columbus OH 43216-5000 or by email to RFConnectors@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4 or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements cited in sections 3, 4 or 5 of this specification, whether or not they are listed.

### 2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

#### FEDERAL STANDARDS

FED-STD-H28 - Screw-Thread Standards for Federal Services.

(See supplement 1 for applicable specification sheets.)

#### DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-C-5541	- Chemical Conversion Coating on Aluminum and Aluminum Alloys.
MIL-A-8625	- Anodic Coatings for Aluminum and Aluminum Alloys.
MIL-F-14072	- Finishes for Ground Based Electronic Equipment.
MIL-DTL-24044	- Flanges, Coaxial Line, Rigid Air Electrical, General Specification For.
MIL-P-24691/3	- Pipe and Tube, Corrosion-Resistant, Stainless Steel, Seamless or Welded.
MIL-C-26074	- Coatings, Electroless Nickel, Requirements For.
MIL-H-28719	- Headers-Hermetically Sealed.

#### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-889	- Dissimilar Metals.
MIL-STD-202	- Test Methods for Electronic and Electrical Component Parts.
MIL-STD-1285	- Marking of Electrical and Electronic Parts.

(See supplement 1 for applicable specification sheets.)

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or [www.dodssp.daps.mil](http://www.dodssp.daps.mil) or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of documents, which are DoD adopted, are those listed in the issue DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

#### INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE-STD-287 - Precision Coaxial Connectors.

(Applications for copies should be addressed to the Institute of Electrical and Electronics Engineers Headquarters, 345 East 47<sup>th</sup> Street, New York NY 10017).

## ASTM INTERNATIONAL (ASTM)

ASTM A240	-	Standard Specification for Heat-Resisting Chromium-Nickel Stainless Steel Plate, Sheet, Strip for Pressure Vessels.
ASTM A484	-	Standard Specification for General Requirements for Stainless Bars, Billets, and Forgings.
ASTM A582	-	Standard Specification for Free-Machining Stainless Steel Bars.
ASTM A666	-	Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
ASTM A693	-	Standard Specification for Precipitation-Hardening Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
ASTM A967	-	Chemical Passivation Treatments For Stainless Steel Parts.
ASTM B16	-	Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines.
ASTM B26	-	Standard Specification for Aluminum-Alloy Sand Castings.
ASTM B36	-	Brass Plate, Sheet, Strip and Rolled Bar.
ASTM B85	-	Standard Specification for Aluminum-Alloy Die Castings.
ASTM B108	-	Standard Specification for Aluminum-Alloy Permanent Mold Castings.
ASTM B121	-	Leaded Brass Plate, Sheet, Strip and Rolled Bar.
ASTM B124	-	Copper and Copper Alloy Forging Rod, Bar and Shapes.
ASTM B152	-	Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar (Metric).
ASTM B194	-	Copper Beryllium Alloy Plate, Sheet, Strip and Rolled Bar.
ASTM B196	-	Copper Beryllium Alloy Rod and Bar.
ASTM B197	-	Copper Beryllium Alloy Wire.
ASTM B209	-	Aluminum and Aluminum-Alloy Sheet and Plate.
ASTM B211	-	Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
ASTM B221	-	Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire Profiles, and Tubes (Metric).
ASTM B241	-	Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
ASTM B339	-	Standard Specification for Pig Tin.
ASTM B488	-	Electrodeposited Coatings of Gold for Engineering Uses.
ASTM B545	-	Standard Specification for Electrodeposited Coatings of Tin.
ASTM B607	-	Specification for Autocatalytic Nickel-Boron Coating for Engineering Use.
ASTM B656	-	Guide for Autocatalytic Nickel-Phosphorous Deposition on Metals for Engineering Use.
ASTM B700	-	Standard Specification for Electrodeposited Coatings of Silver for Engineering Use.
ASTM B733	-	Specification for Autocatalytic Nickel-Phosphorous Coatings on Metals.
ASTM D2116	-	FEP-Fluorocarbon Molding and Extrusion Materials.
ASTM D4894	-	Polytetrafluoroethylene (PTFE) Granular Molding and RAM Extrusion Materials, Standard Specification For.
ASTM D4895	-	Polytetrafluoroethylene (PTFE) Resins Produced From Dispersion, Test Method For.

(Applications for copies should be addressed to ASTM INTERNATIONAL, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959).

## AMERICAN SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

AMS-QQ-A-225	-	Aluminum and Aluminum Alloy, Bar, Rod Wire, or Special Shapes; Rolled, Drawn or Cold Finished, General Specification.
AMS-QQ-A-250	-	Aluminum and Aluminum Alloy Plate and Sheet; General Specification.
SAE-AMS-QQ-N-290	-	Nickel Plating (Electrodeposited).
SAE AMS QQ-P-35	-	Passivation Treatment for Corrosion-Resistant Steel.
SAE AMS-QQ-S-763	-	Steel Bars, Wire, Shapes, and Forgings; Corrosion Resistant.
SAE AMS 2404	-	Plating, Electroless Nickel.
SAE AMS 2405	-	Electroless Nickel Plating Low Phosphorus.
SAE AMS 2404	-	Plating, Nickel-Thallium-Boron or Nickel-Boron Electroless Nickel Deposition.

(Application for copies should be addressed to the American Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001).

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern (see 6.2).

3.2 Qualification. Dummy loads furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.5 and 6.3).

3.3 Critical interface materials. Materials shall be as specified herein. If materials other than those specified are used, the contractor shall certify to the qualifying activity that the substitute material enables the dummy loads to meet the requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the product. When a definite material is not specified, a material shall be used which will enable the dummy load to meet the performance requirements of this specification.

3.3.1 Dissimilar metals. Dissimilar metals between which an electromotive couple may exist shall not be placed in contact with each other. Reference is made to MIL-STD-889 for definition of dissimilar metals.

3.3.2 Nonmagnetic materials. All parts shall be made from materials, which are classified, as nonmagnetic. (less than 2 mμ).

3.3.3 Brass. Brass shall be in accordance with ASTM B16, B36, B121, B16M and ASTM B124.

3.3.4 Copper alloy. Copper alloy shall be in accordance with ASTM B36 or ASTM B121.

3.3.5 Copper beryllium. Copper beryllium shall be in accordance with ASTM B194 and ASTM B197.

3.3.6 Corrosion-resisting steel. Corrosion-resisting steel shall be in accordance with ASTM A240, A666, A693, SAE-AMS-QQ-S-763, ASTM A484 and ASTM A582. Corrosion resisting steel pipe shall be in accordance with MIL-P-24691/3.

3.3.7 Aluminum alloy. Aluminum alloy shall be in accordance with SAE-AMS-QQ-A-250 and ASTM B209.

3.4. Configuration and features. Dummy loads shall be of the configuration and physical dimensions specified (see 3.1). It is not permitted to compensate for discontinuities of the dummy load by the design of the mating connector.

3.4.1 RF connection interface. The RF connection interface shall be in accordance with MIL-STD-348 or MIL-F-24044 as applicable (see 1.2 and 3.1). The material, plating and gauging for the connector interface shall conform to the application specifications. When specified precision connectors shall be in accordance with IEEE-STD-287 or MIL-STD-348.

3.4.1.1 Printed circuit connectors. Printed circuit connectors for a specific dummy load shall conform to MIL-DTL-55302 as applicable (see 3.1).

3.4.1.2 Socket pins. Socket pins for specific dummy loads shall be in accordance with header specification MIL-H-28719 unless otherwise specified (see 3.1).

3.4.1.3 Receptacles. Receptacle connections for a specific dummy load shall be as specified (see 3.1).

3.4.1.4 Connection caps. All coaxial connections shall be sealed with push-on plastic caps to prevent both damage and the entrance of moisture and foreign material during storage. These caps will be supplied with the dummy load.

3.4.1.5 Connection metal parts. Unless otherwise specified, the connector and male center pins shall be made of corrosion-resisting steel. The female center contact pins shall be made of beryllium copper, silver plating, or when otherwise specified, gold plated (see section 2).

3.4.1.6 Plastic. Plastic shall be in accordance with ASTM D4894 or ASTM D4895.

3.4.2 Operating frequency range. The frequency range shall be as specified (see 3.1).

3.4.3 Impedance. The nominal impedance shall be as specified (see 3.1).

3.4.4 Power handling capability.

3.4.4.1 Average power rating. The average power rating shall be as specified (see 3.1) at the ambient temperature or heat sink temperature.

3.4.4.2 Maximum peak power. The maximum peak power, if applicable, shall be as specified (see 3.1).

3.4.5 Fabrication of shell. The shell of the dummy load shall be forged cast, or fabricated of plate, sheet, drawn or extruded stock, or a combination of some of or all the methods. The choice of the shell material configuration shall provide sufficient heat transfer to prevent the exceeding the maximum specified exposed temperature under conditions of simultaneous maximum (1) rated power, (2) ambient temperature and (3) altitude (see (3.1)).

3.4.6 Finish (critical interface). Unless otherwise specified (see 3.1), the finish shall be as specified in 3.4.6.1, 3.4.6.2, or 3.4.6.3.

3.4.6.1 Materials.

3.4.6.1.1 Gold bodies. Gold bodies shall be plated to a minimum gold thickness of 50 micro inches (1.27  $\mu\text{m}$ ) in accordance with ASTM B488, type II code C, class 1.27, over 50  $\mu\text{m}$  inches (1.27  $\mu\text{m}$ ) minimum of nickel in accordance with AMS-QQ-N-290, class 1, measured anywhere along the mating surface, for all series.

3.4.6.1.1 Gold contacts. The male pin shall be plated to a minimum gold thickness of 50 micro inches (1.27  $\mu\text{m}$ ) in accordance with ASTM B488, type II code C, class 1.27, over 50 micro inches (1.27 micro meters) minimum of nickel in accordance with AMS-QQ-N-290, class 1, measured anywhere along the mating surface, for all series. The socket contact shall be plated to a minimum of 50 micro inches (1.27 micro meters) of gold in accordance with ASTM B488, type II, code C, class 1.27, over 50 micro inches (1.27 micro meters) of nickel in accordance with AMS-QQ-N-290, class 1, including the I.D., measured at a depth of .040 inch (1.01mm) minimum. The plating on non-significant surfaces in the I.D. shall be of sufficient thickness to ensure plating continuity and uniform utility and protection. This plating may consist of an underplate only. A silver underplate shall not be permitted on any contact, pin or socket .

3.4.6.1.2 Nickel. Nickel shall be in accordance with MIL-C-26074 or SAE-AMS-QQ-N-290.

3.4.6.1.3 Silver. Silver shall be in accordance with ASTM B700.

3.4.6.1.4 Tin. Tin shall be in accordance with ASTM B339 or ASTM B545.

3.4.6.1.5 Paint. Paint shall be in accordance with MIL-F-14072.

3.4.6.1.6 Anodic coating. Anodic coating shall be in accordance with MIL-A-8625.

3.4.6.2 Passivation treatment. Passivation treatments shall conform to ASTM A967 or SAE-AMS-QQ-P-35.

3.4.6.3 Aluminum alloys. Aluminum alloys surfaces shall be chemically treated and in accordance with MIL-C-5541.

3.4.7 Threaded parts. All threaded parts shall have screw threads in the unified screw threads series in accordance with FED-STD-H28 and supplements.

3.4.8 Weight. The weight shall be as specified (see 3.1).

3.4.9 Ambient temperature. The ambient temperature shall be as specified (see 3.1).

3.4.10 Coolant pressure (when specified). The coolant pressure shall be as specified (see 3.1).

3.5 Force to engage/disengage (when specified for coaxial dummy loads).

3.5.1 Bayonet and threaded types. When tested as specified in 4.6.2.1, the torque necessary to completely couple or uncouple the connector of the dummy load shall not exceed that specified (see 3.1). Also the longitudinal force necessary to initiate the engaging or disengaging cycle shall not exceed that specified (see 3.1).

3.5.2 Push-on connector types. When tested as specified in 4.6.2.2, the forces necessary to fully engage or disengage the connector of the dummy load shall not exceed that specified (see 3.1).

3.6 Coupling proof torque (when specified for coaxial dummy loads). When tested as specified in 4.6.3, the coupling mechanism (threaded types) shall not be dislodged, and the connector of the dummy loads shall meet the requirements of 3.5.1.

3.7 Connector durability (when specified for coaxial dummy loads). After the connector of the dummy loads is tested as specified in 4.6.4, the connector shall meet the requirements of 3.5.1 and 3.5.2.

3.8 Solderability (as applicable). When dummy loads with solderable connections are tested as specified in 4.6.5, there shall be no evidence of pinholes or blistering.

3.9 Resistance to soldering heat (as applicable). When dummy loads with solderable connections are tested as specified in 4.6.6, there shall be no damage to the dummy load or to the terminal insulator that will cause electrical failure. Chipping of the terminal insulator shall not be cause for failure unless the chipping extends to the outer periphery. After the test, the VSWR shall not exceed the specified (see 3.1).

3.10 Resistance to solvents (as applicable). When dummy loads are tested as specified in 4.6.7, there shall be no evidence of illegible marking, mechanical damage, or deterioration of material of finishes.

3.11 Terminal strength (as applicable). When tested in accordance with 4.7.8, connectors shall not crack, nor break, and there shall be no loosening of parts. Connectors shall be in full engagement during vibration and the coupling device shall not loosen as a result of vibration. Interruptions of electrical continuity shall not last longer than 10 microseconds.

3.12 Burn-in (screened only). All screened dummy loads shall be burn-in as specified in 4.6.9. After burn-in, the VSWR shall not exceed the value specified and there shall be no evidence of mechanical damage.

3.13 Voltage standing wave ratio (VSWR). When dummy loads are tested as specified in 4.6.10, the VSWR shall not exceed the value specified (see 3.1).

3.14 Thermal shock. After the thermal shock test specified in 4.6.11, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.15 Vibration. After the vibration test specified in 4.6.12, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.16 Shock. . After the shock test specified in 4.6.13, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.17 Moisture resistance. After the moisture resistance test specified in 4.6.14, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.18 Barometric pressure (when specified). After the barometric pressure test specified in 4.6.15, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.19 Salt spray (when specified). After the salt spray test specified in 4.6.16, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.20 Power dissipation. After the power dissipation test specified in 4.6.17, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1). For liquid cooled loads, the outside temperature of the water shall not exceed the value specified (see 3.1).

3.21 Endurance. After the endurance test specified in 4.6.18, the dummy loads shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1). For liquid cooled loads, the outside temperature of the water shall not exceed the value specified (see 3.1).

3.22 Overload (when specified). After the overload test specified in 4.6.19, the dummy load shall show no physical damage, and the VSWR shall not exceed the value specified (see 3.1).

3.23 Pressurization (when specified). During the pressurization test specified in 4.6.20, there shall be no evidence of loss of pressure as detected by a continuous stream of escaping air bubbles.

3.24 Marking. Dummy loads shall be marked in accordance with MIL-STD-1285 with the PIN and the manufacturer's CAGE code. The marking location is optional; when practicable, a location should be picked that will be least likely to be covered in cable assembly or installation. Marking is required on all parts manufactured to this specification unless specifically excepted (see 3.1).

3.24.1 Serialization. When the contract requires that dummy loads be serialized, each dummy load shall be marked with a unique serial number assigned consecutively within the inspection lot, allowing traceability of the dummy load.

3.25 Workmanship. Dummy loads shall be manufactured and processed in such a manner as to be uniform in quality, and the shell of the dummy load shall be free from tool marks, burrs, sharp edges, deep scratches, and other defects that will affect life, serviceability, or appearance.

#### 4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment (i.e., industry standard, military standards) shall be required.

4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.4).
- b. Conformance inspection (see 4.5).
- c. Periodic inspection (see 4.5.2.1.1).

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with materials, equipment, and procedures that will be used in subsequent production. Group qualification can be obtained by submitting the proper item within the group (see appendix).

4.4.1 Sample size. Four dummy loads from each group to be qualified shall be subjected to qualification inspection.

4.4.2 Qualification inspection. Qualification inspection shall consist of the examinations and tests specified in table I in the order shown.

4.4.3 Failures. One or more failures shall be cause for refusal to grant qualification approval. Failure criteria for sample units shall be as specified in the applicable requirement paragraph.



TABLE I. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection and weight	3.1, 3.3 to 3.4.8 incl. 3.24 and 3.25	4.6.1
Force to engage/disengage <u>1/</u>	3.5	4.6.2, 4.6.2.1, 4.6.2.2
Coupling proof torque <u>1/</u>	3.6	4.6.3
Connector durability <u>1/</u>	3.7	4.6.4
Solderability <u>2/</u>	3.8	4.6.5
Resistance to soldering heat <u>2/</u>	3.9	4.6.6
Resistance to solvents <u>2/</u>	3.10	4.6.7
Terminal strength <u>2/</u>	3.11	4.6.8
VSWR	3.13	4.6.10
Thermal shock	3.14	4.6.11
Vibration	3.15	4.6.12
Shock	3.16	4.6.13
Moisture resistance	3.17	4.6.14
Barometric pressure <u>3/</u>	3.18	4.6.15
Salt spray <u>3/</u>	3.19	4.6.16
Power dissipation	3.20	4.6.17
Endurance	3.21	4.6.18
Over load <u>3/</u>	3.22	4.6.19
Pressurization <u>3/</u>	3.23	4.6.20

1/ For coaxial dummy loads, when specified (see 3.1).

2/ For stripline dummy loads, when specified (see 3.1).

3/ When specified (see 3.1).

4.4.4 Disposition of qualification sample units. Sample units which have been subjected to qualification testing shall not be deliverable on any contract. The government reserves the right to retain the sample units or to require the contractor to furnish the sample units with the qualification inspection report.

4.4.5 Retention of qualification. To retain qualification, the contractor shall verify in coordination with the qualifying activity the capability of manufacturing products, which meet the performance requirements of this specification. Refer to the qualifying activity for the guidelines necessary to retain qualification to this particular specification. The contractor shall immediately notify the qualifying activity at any time that the inspection data indicates failure of the qualified product to meet the performance requirements of this specification.

#### 4.5 Conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A inspection.

4.5.1.1 Inspection lot. An inspection lot shall consist of all dummy loads of the same PIN, produced under essentially the same conditions, and offered for inspection at one time.

4.5.1.2 Group A inspection. Group A inspection shall consist of the inspections specified in table II, in the order shown.

TABLE II. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection and weight	3.1, 3.3 to 3.4.8 incl., 3.24 and 3.25	4.6.1
VSWR	3.13	4.6.10
Thermal shock <u>1/</u>	3.14	4.6.11
Burn-in <u>1/</u>	3.12	4.6.9

1/ For screened units only.

4.5.1.2.1 Sampling plan. All units shall be subjected to group A inspection. No failures are permitted. If one or more sample units fail, the sample lot shall be considered to have failed. The lot may be screened for that particular defect and defects removed. After screening, the lot shall be retested. Any failure in the screened lot shall constitute failure of the lot and the lot shall be rejected

4.5.2 Qualification verification inspection. Qualification verification inspection shall consist of group B. Except where the results of these inspections show noncompliance with the applicable requirements (see 4.5.2.1.4), delivery of products which have passed group A shall not be delayed pending the results of these qualification verification inspections.

4.5.2.1 Group B inspection. Group B inspection shall consist of the inspections specified in table III, in the order shown. Group B inspection shall be made on sample units selected from inspection lots which have passed the group A inspection. These samples may be comprised from various production runs.

TABLE III. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Force to engage/disengage <u>1/</u>	3.5	4.6.2
Coupling proof torque <u>1/</u>	3.6	4.6.3
Connector durability <u>1/</u>	3.7	4.6.4
Solderability <u>2/</u>	3.8	4.6.5
Resistance to soldering heat <u>2/</u>	3.9	4.6.6
Resistance to solvents <u>2/</u>	3.10	4.6.7
Terminal strength <u>2/</u>	3.11	4.6.8
VSWR	3.13	4.6.10
Thermal shock	3.14	4.6.11
Vibration	3.15	4.6.12
Shock	3.16	4.6.13
Moisture resistance	3.17	4.6.14
Barometric pressure <u>3/</u>	3.18	4.6.15
Salt spray <u>3/</u>	3.19	4.6.16
Power dissipation	3.20	4.6.17
Endurance	3.21	4.6.18
Over load <u>3/</u>	3.22	4.6.19
Pressurization <u>3/</u>	3.23	4.6.20

1/ For coaxial dummy loads, when specified (see 3.1).

2/ For stripline dummy loads, when specified (see 3.1).

3/ When specified (see 3.1).

4.5.2.1.1 Periodic inspection. Four sample units shall be selected every 24 months. If this level of sampling is passed two successive times, the contractor may select four sample units every 48 months. In the event of a failure, sampling shall revert to the 24-month interval.

4.5.2.1.2 Failures. If one or more sample units fail to pass group B inspection, the lot shall be considered to have failed.

4.5.2.1.3 Disposition of sample units. Sample units which have been subjected to group B inspection shall not be delivered on contract.

4.5.2.1.4 Noncompliance. If a sample fails to pass group B inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which were manufactured under essentially the same conditions, with essentially the same materials, and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the Government, has been taken. After the corrective action has been taken, group B inspection shall be repeated on additional sample units (all inspection, or the inspection which the original sample failed), at the option of the qualifying activity. Group A inspection may be reinstituted; however, final acceptance shall be withheld until the group B inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action taken shall be furnished to the cognizant inspection activity and the qualifying activity.

4.6 Methods of inspection. (The following identified tests and test methods assure dummy load integrity within typical operating conditions and applications. Alternate commercial industry standard test methods are allowed; however when an alternate methods is used, the qualifying activity must be notified prior to the performance of the test. The test methods described herein are proven methods and shall be the referee methods in case of dispute.)

4.6.1 Visual and mechanical examination. Dummy loads shall be examined to verify that the materials, design, construction, physical dimensions, finish, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3, to 3.4.8 inclusive, 3.24 and 3.25).

4.6.2 Force to engage/disengage (see 3.5).

4.6.2.1 Bayonet and threaded types (see 3.5.1). The RF connector of the dummy load shall be engage with its mating standard part. During the entire coupling/uncoupling cycle (until the connector is fully engage/disengaged) the force and/or torque necessary shall not exceed those specified (see 3.1). A threaded coupled connector is fully engaged with its mating standard part when their reference planes coincide. A bayonet coupled connector is fully engage with its mating standard part when the bayonet stubs have passed the decent and their reference planes coincide. No additional torque shall be applied. The mating standard part is a steel jig containing the critical interface dimensions. It's spring members when applicable shall be heat treated beryllium copper. As an option for this test, a qualified mating connector may be used in place of the standard steel jig with the approval of the qualifying agency.

4.6.2.2 Push-on connector types (see 3.5.2). The connector of the dummy load under test shall be engaged with its standard mating part (gage). During the engaging cycle, the force necessary to fully engage the connector shall not exceed that specified (see 3.1). Upon completion of engagement, an opposite force necessary for disengagement shall be applied. This force shall be within the limits specified, and shall include any unlatching force required. As an option for this test, a qualified mating connector may be used in place of the standard steel jig with the approval of the qualifying agency

4.6.3 Coupling proof torque (see 3.6). The connector of the dummy load under test shall be engaged with its standard mating part (gage) and the coupling nut tightened to the torque specified (see 3.1). After one minute, the connector of the dummy load and its mating standard part shall be disengage. As an option for this test, a qualified mating connector may be used in place of the standard steel jig with the approval of the qualifying agency.

4.6.4 Connector durability (see 3.7). The connector of the dummy load shall be subjected to the number of cycles of mating and unmating specified (see 3.1). The connector of the dummy load and its mating part shall be completely engaged and completely disengaged during the cycle. Lubrication of the threads or rotational parts shall not be employed for this test unless specified (see 3.1). It is permissible to shake or blow debris from the threads or interface surfaces at intervals of not less than 50 cycles. Solvents or loss shall not be used for cleaning.

4.6.5 Solderability (see 3.8). The terminal of the dummy loads shall be tested in accordance with method 208 of MIL-STD-202. Where applicable a heat sink may be used.

4.6.6 Resistance to soldering heat (see 3.9). Dummy loads shall be tested in accordance with method 210 of MIL-STD-202. The following details and exceptions shall apply:

- a. Special preparation – The terminal shall not have been soldered previously.
- b. Depth of insertion in the molten solder – To a point 0.062 inch + 0.031, -0 inch from the body.
- c. Test condition A.
- d. Cooling time - stabilize to +25°C.

4.6.7 Resistance to solvents (see 3.10). Dummy loads shall be tested in accordance with method 215 of MIL-STD-202. The following details shall apply:

All portions of the dummy loads shall be brushed.

4.6.8 Terminal strength (see 3.11). Dummy loads shall be tested in accordance with method 211 of MIL-STD-202 test condition A, applied force 1.5 pounds.

4.6.9 Burn-in (screened only)(see 3.12). All screened dummy loads shall be subjected to the specified rated average power (see 3.1), at the highest specified operating temperature (see 3.1) for a period of 96 +5,-0 hours. Where applicable (see 3.1), the dummy loads may be mounted to a heat sink. After the burn-in, the VSWR of the dummy load shall be measured and the measured value shall be no greater than the value specific (see 3.1). If the VSWR value exceeds that specified, the dummy loads shall be considered to have failed. All dummy loads subjected to burn-in shall be serialized for correlation of the VSWR data to the specific unit.

4.6.10 VSWR (see 3.13). The VSWR shall be measured across the frequency range (see 3.1) using a sweep frequency technique or at 10 equally spaced points evenly distributed across the frequency range using a slotted line method. The test equipment(s) shall be capable of providing a continuous measurement of VSWR over the specific frequency range. A means shall be provided for producing a permanent record of the dummy load's VSWR versus frequency. If VSWR is not directly measured; that is, if return loss is measured and VSWR is calculated from that measurement, the permanent record shall indicate the worse case VSWR numerically for each frequency band and shall provide the calculation used to obtain the calculated value. The permanent record of each dummy load shall be packaged with the unit when shipped. The measurement system and permanent record shall provide a minimum accuracy of .01 over the frequency ranges below 26.5 GHz and a minimum accuracy of .02 over the frequency ranges 26.5 GHz and above.

4.6.11 Thermal shock (3.14). With the RF connection uncovered, dummy loads shall be tested in accordance with method 107 of MIL-STD-202. The following details shall apply:

- a. Test condition – B, unless otherwise specified (see 3.1).
- b. Final measurement – VSWR shall be measured as specified in 4.6.10.

4.6.12 Vibration (see 3.15). Unless otherwise specified (see 3.1), dummy loads shall be tested as specified in 4.6.12.1. When specified (see 3.1), dummy loads shall be tested as specified in 4.6.12.2.

4.6.12.1 Simple harmonic nature. Dummy loads shall be tested in accordance with method 201 of MIL-STD-202. The following details shall apply:

- a. Tests and measurements prior to vibration – None.
- b. Method of mounting – Rigidly mounted to the test platform by its normal mounting means. Dummy loads which employ rubber bumpers as isolators shall have these isolators removed and the dummy loads in turn held secure to the test platform during the test. Small dummy loads not equipped with other mounting provisions shall be considered normally mounted when mated with the complementary mounting receptacle.
- c. Test and measurements after vibration – VSWR shall be measured as specified in 4.6.10.

4.6.12.2 Random nature. Dummy loads shall be tested in accordance with method 214 of MIL-STD-202. The following details shall apply:

- a. Method of mounting – Rigidly mounted to the test platform by its normal mounting means.
- b. Test condition – II D and 15 minutes duration, unless otherwise specified.
- c. Test and measurements after vibration – VSWR shall be measured as specified in 4.6.10.

4.6.13 Shock (see 3.16). Dummy loads shall be tested in accordance with method 213 of MIL-STD-202. The following details shall apply:

- a. Mounting – Mounted securely on mounting table to simulate service conditions. Small dummy loads not equipped with other mounting provisions shall be considered normally mounted when mated with the complementary mounted receptacles.
- b. Test condition letter – I.
- c. Measurements after test – VSWR shall be measured as specified 4.6.10.

4.6.14 Moisture resistance (see 3.17). Dummy loads shall be tested in accordance with method 106 of MIL-STD-202. The following details shall apply:

- a. Loading voltage – Not applicable.
- b. Final measurement - After drying period, VSWR shall be measured as specified 4.6.10.

4.6.15 Barometric pressure (see 3.18). Dummy loads shall be tested in accordance with method 105 of MIL-STD-202. The following details shall apply:

- a. Method mounting – Normal mounting means.
- b. Test condition letter – As specified (see 3.1).
- c. Measurement after test – VSWR shall be measured as specified in 4.6.10.
- d. Tests during subjection to reduction pressure (see 3.1).
- e. Exposure time prior to measurements (see 3.1).

4.6.16 Salt spray (see 3.19). Dummy loads shall be tested in accordance with method 101 of MIL-STD-202. The following details shall apply:

- a. Mounting – Normal mounting means. Normal mounting means shall include mating to complementary connectors whose cable entries (backends) are sealed against salt spray penetration (see 3.1).
- b. Test condition letter – B, salt solution – 5 percent.
- c. Measurement after test – VSWR shall be measured as specified in 4.6.10.

4.6.17 Power dissipation (see 3.20). The specified peak and average power shall be applied simultaneously at any frequency within the specific range (see 3.1). When no peak power is specified, apply 1.5 times the rated average power. Power shall be maintained for a period of 15 minutes after the dummy load has reached thermal equilibrium. It is considered that thermal equilibrium has been reached when the temperature of the dummy load has not changed by more than 5°C over a period 5 minutes. For pressurized dummy loads, the internal pressure shall be as specified (see 3.1). For liquid cooled dummy loads, the minimum flow rate and coolant pressure specified (see 3.1) shall be used with the input temperature specified.

4.6.18 Endurance (see 3.21). Dummy loads shall be subjected to the specified peak power (when applicable) and average power for test purposes, for 10 cycles of 1 hour power on and a minimum of 1 hour off, at any frequency within the specified frequency range (see 3.1). The VSWR shall be measured as specified in 4.6.10 preceding the test and at intervals of 1 hour thereafter during the off period. For pressurized loads, the internal pressure shall be as specified (see 3.1). For liquid cooled loads the minimum flow rate and coolant pressure specified (see 3.1) shall be used with the input temperature as specified.

4.6.19 Overload (see 3.22). The specified overload power shall be applied for the time specified (see 3.1). The load shall then be checked for breakdown and deterioration. VSWR shall then be measured as specified in 4.6.10.

4.6.20 Pressurization (see 3.23). Dummy load RF path shall be subjected to the specified (see 3.1) internal air pressure for at least 5 minutes while immersed in tap water of approximately 20°C. For liquid cooled loads, coolant chamber shall be subjected to an internal air pressure as specified (see 3.1) for at least 5 minutes while immersed in tap water of approximately 20°C.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Dummy loads covered by this specification are intended for terminating coaxial and striplines.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1).
- c. Packaging requirements (see 5.1).
- d. Title, number and date of the applicable specification sheet.
- e. The complete PIN of the dummy load ordered.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center Columbus (DSCC-VQ), P.O. Box 3990, Columbus, Ohio 43216-5000.

6.4 References to superseded specifications. All the requirements of MIL-DTL-39030 are interchangeable with those of MIL-PRF-39030, therefore, previously existing documents (OEM drawings, etc.) referencing MIL-PRF-39030 or MIL-PRF-55339 need not be changed.

6.5 Subject term (key word) listing.

Interface  
Voltage Standing Wave Ratio (VSWR)

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

CONCLUDING MATERIAL

Custodians:

Army – CR  
Navy – EC  
Air Force – 11  
DLA- -CC

Preparing activity:

DLA - CC

(Project 5985-1289-000)

Review activities:

Army – AV, MI  
Navy – AS, MC, OS, SH  
Air Force – 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).

## MIL-DTL-39030E

## APPENDIX A

## GROUP QUALIFICATION

## A.1 SCOPE

A.1.1 Scope. The purpose of this appendix is to provide manufacturers a grouping that can be used to obtain qualification for a number of items by qualifying one item. Alternate groupings may be offered by manufacturers for consideration by the qualifying activity.

TABLE IV. Grouping for qualification.

Group number	Qualifying PIN	PIN of dummy loads qualified
1	M39030/4-01	M39030/4-02 and M39030/3-01 thru -15
2	M39030/3-11	M39030/3-01 thru -10, and M39030/3-12 thru -15
3	M39030/5-05	M39030/5-01, thru -04, -06 and -07
4	M39030/8-01	M39030/7-01 thru -06; M39030/5-01 thru -07
5	M39030/11-04	M39030/6-01 thru -07; M39030/11-01 thru -03
6	M39030/6-06	M39030/6-01 thru -05 and -07
7	M39030/16-02	M39030/13-01; M39030/14-01 thru -03; M39030/16-01, -03
8	M39030/14-02	M39030/13-01; M39030/14-01 and -03
9	M39030/20-06	M39030/20-01 thru -05; M39030/21-01 thru -04
10	M39030/21-04	M39030/20-01 thru -05; M39030/21-01 thru -03